

Yongman Kim, Ph.D.

Energy Geoscience Division
Lawrence Berkeley National Laboratory

Tel: 510-486-4566
Email: ymkim@lbl.gov

1 Cyclotron Road
MS 74R316C
Berkeley, CA 94720

SUMMARY:

As a senior scientific engineer associate, I plan and design experiments, setup experimental systems, develop and/or verify analytical methods, optimize the processes, formulate chemical compounds, conduct instrumental analysis, review technical specifications, prepare standard operation procedures, prepare reports and presentations, and manage chemical inventory. Also, I manage the laboratories in good working condition, keep the laboratories in 100% compliance of Health Safety Environmental regulations. In addition, I provide training to junior/new group members, and troubleshoot various problems occurring at laboratory.

PROFESSIONAL EXPERIENCE:

- Investigate methods to characterize subsurface organic matters sampled in various climate, vegetation, and depth.
- Study relation of subsurface temperature-ground water level-surface soil CO₂ flux relation using soil packed column and incubation experiments.
- Investigate sustainable remediation method for U238 by precipitating uranium from an aqueous solution and/or sediment comprising uranium and/or vanadium. U.S. Patent was granted in 2013 (US 8,512,572 B1).
- Develop analytical methods for characterizing aqueous uranyl vanadate compounds in various oxic & pH conditions for investigating uranium vanadate precipitation.
- Investigate possible utilization of natural organic matters on enhanced oil recovery in combination with geological CO₂ storage.
- Study wettability alterations on various mineral surfaces caused by supercritical CO₂. The findings were published in one of the top rated peer reviewed scientific journal (Environmental Science and Technology, 2015).
- Design and build up microfluidic experimental system capable of in-situ imaging under high pressure and temperature condition.
- Collaborate with scientists in Molecular Foundry (Berkeley, CA) to prepare and characterize engineered nanoparticles.
- Study effects of cation concentration-salinity-pH on the stability of nanoparticles in aqueous phase.
- Investigate redox changes of uranium and its transport through saturated sediments by soil-packed column experiments.
- Investigate reactive transport of uranium in the Hanford vadose zone (to simulate the historical Hanford uranium spill event) by formulating/injecting chemical compounds for synthetic uranium waste solution.

- Elucidate thermal properties of double layered clay minerals using various in-situ high pressure/temperature analytical methods.
- Study adsorption properties of the double layered clay minerals under CO₂ atmosphere.
- Develop ceramic membrane preparation with the double layered clay minerals and investigated the transport properties under elevated pressure and temperature.
- Develop synthetic method for hyperbranched polymers and characterize them with various analytical instruments including photo luminescence, UVVIS, GPC, NMR, MS, and FTIR.

INSTRUMENTAL SKILLS (ADVANCED LEVEL):

- Electron microscopy: SEMEDAX / TEM
- Elemental analysis: ICPMS / ICPOES / TOCTIC / LSC / KPA
- Chromatography: GC / HPLC / GCMS/ IC / GPC
- Spectroscopy: FTIRDRIFT / UVVIS / XRD / microXRD / XRF / NMR / MS
- Thermal analysis: TGA / DTG / DSC
- Others: Dynamic Light Scattering / Zetapotential / BET / Autotitrator / pH meter / Conductivity meter / Turbidimeter / Microscopy / High Pressure System / Vacuum system / Ultracentrifuge

EDUCATION:

University of Southern California, Los Angeles, CA, US
 Doctorate, Major: Chemical Engineering

Seoul National University, Seoul, South Korea
 Master of Science, Major: Chemical Technology

Seoul National University, Seoul, South Korea
 Bachelor of Science, Major: Chemical Technology

PROFESSIONAL PUBLICATIONS:

Shibo Wang, Tetsu K Tokunaga, Jiamin Wan, Wenming Dong, and Yongman Kim, Capillary pressure-saturation relations in quartz and carbonate sands: Limitations for correlating capillary and wettability influences on air, oil, and supercritical CO₂ trapping, Water Resources Research, 52, 6671-6690, 2016.

Tetsu K. Tokunaga, Yongman Kim, Mark E. Conrad, Markus Bill, Chad Hobson, Kenneth H. Williams, Wenming Dong, Jiamin Wan, Mark J. Robbins, Philip E. Long, Boris Faybishenko, John N. Christensen, and Susan S. Hubbard, Deep Vadose Zone Respiration Contributions to CO₂ Fluxes From a Semiarid Floodplain, Vadose Zone Journal, 15, 7, 2016.

Lijie Zhang, Yongman Kim, Haesung Jung, Jiamin Wan, and Young-Shin Jun; Effects of Salinity-Induced Chemical Reactions on Biotite Wettability Changes under Geologic CO₂ Sequestration Conditions, Environmental Science and Technology Letters, 3, 92-97, 2016.

Prem Bikkina, Jiamin Wan, Yongman Kim, Timothy J Kneafsey, Tetsu K Tokunaga, Influence of wettability and permeability heterogeneity on miscible CO₂ flooding efficiency, *Fuel*, 166, 219-226, 2015.

Jiamin Wan, Yongman Kim, Tetsu K Tokunaga, Contact angle measurement ambiguity in supercritical CO₂–water–mineral systems: Mica as an example, *International Journal of Greenhouse Gas Control*, 31, 128-137, 2014.

Tetsu K Tokunaga, Jiamin Wan, Jong-Won Jung, Tae Wook Kim, Yongman Kim, and Wenming Dong, Capillary pressure and saturation relations for supercritical CO₂ and brine in sand: High-pressure Pc(Sw) controller/meter measurements and capillary scaling predictions, *Water Resources Research*, 49(8), 4566-4579, 2013.

Tetsu K. Tokunaga, Yongman Kim, and Jiamin Wan, Aqueous Uranium(VI) Concentrations Controlled by Calcium Uranyl Vanadate, *Environmental Science and Technology*, 46(14), 7471-7477, 2012.

Yongman Kim, Jiamin Wan, Timothy J. Kneafsey, and Tetsu K. Tokunaga, Dewetting of Silica Surfaces upon Reactions with Supercritical CO₂ and Brine: Pore-Scale Studies in Micromodels, *Environmental Science and Technology*, 46(7), 4228-4235, 2012.

Saeed Torkzaban, Yongman Kim, Martin Mulvihill, Jiamin Wan, and Tetsu K. Tokunaga, Transport and Deposition of Functionalized CdTe nanoparticles in saturated porous media, *Journal of Contaminant Hydrology*, 118(3-4), 208-217, 2010.

Tetsu K. Tokunaga, Yongman Kim, and Jiamin Wan, Potential Remediation Approach for Uranium-contaminated Groundwaters Through Potassium Uranyl Vanadate Precipitation, *Environmental Science and Technology*, 43(14), 5467-5471, 2009.

Jiamin Wan, Yongman Kim, Tetsu K. Tokunaga, Zheming Wang, Suvasis, Dixit, Carl Steefel, Eduardo Saiz, Martin Kunz, and Nobumichi Tamura; Spatially Resolved U(VI) Partitioning and Speciation: Implications for Plume Scale Behavior of Contaminant U in the Hanford Vadose Zone, *Environmental Science and Technology*, 43(7), 2247-2253, 2009

Tetsu K. Tokunaga, Jiamin Wan, Yongman Kim, Rebecca Daly, Eoin Brodie, Terry C. Hazen, and Mary K. Firestone; Influence of organic carbon supply rate on uranium bioreduction in initially oxidizing, contaminated sediment, *Environmental Science and Technology*, 42(23), 8901-8907, 2008.

Jiamin Wan, Tetsu K. Tokunaga, Yongman Kim, Eoin Brodie, Rebecca Daly, Terry C. Hazen, and Mary K. Firestone; Effect of organic carbon supply rates on uranium mobility in a previously bioreduced contaminated sediment, *Environmental Science and Technology*, 42(20), 7573-7579, 2008.

Tetsu K. Tokunaga, Jiamin Wan, Yongman Kim, Steve R. Sutton, Matthew Newville, Antonio Lanzirotti, and William Rao; Real-time X-ray absorption spectroscopy of uranium, iron, and manganese in contaminated sediments during bioreduction, *Environmental Science and Technology*, 42(8), 2839-2844, 2008.

Jiamin Wan, Tetsu K. Tokunaga, Yongman Kim, and R. Jeffrey Serne; Effect of saline waste solution infiltration rate on uranium retention and spatial distribution in Hanford sediments, *Environmental Science and Technology*, 42(6), 1973-1978, 2008.

Nayong Kim, Yongman Kim, Theodore T. Tsotsis, and Muhammad Sahimi; Atomistic simulation of nanoporous layered double hydroxide materials and their properties. I. Structural modeling, *Journal of Chemical Physics*, 122(21), Art. No. 214713, 2005.

Yongman Kim, Weishen Yang, Paul K. T. Liu, Muhammad Sahimi, and Theodore T. Tsotsis; Thermal evolution of the structure of a Mg-Al-CO₃ layered double hydroxide: sorption reversibility aspects, *Industrial & Engineering Chemistry Research*, 43(16), 4559-4570, 2004.

Weishen Yang, Yongman Kim, Paul K. T. Liu, Muhammad Sahimi, and Theodore T. Tsotsis; A study by in situ techniques of the thermal evolution of the structure of a Mg-Al-CO₃ layered double hydroxide, *Chemical Engineering Science*, 57(15), 2945-2953, 2002.